SNC2D – Unit 1 Test (Biology)

Name: Answers

K	**/ 24**
T	**/ 7**
C	**/ 10**
A	**/ 9**
Total	**/ 50**

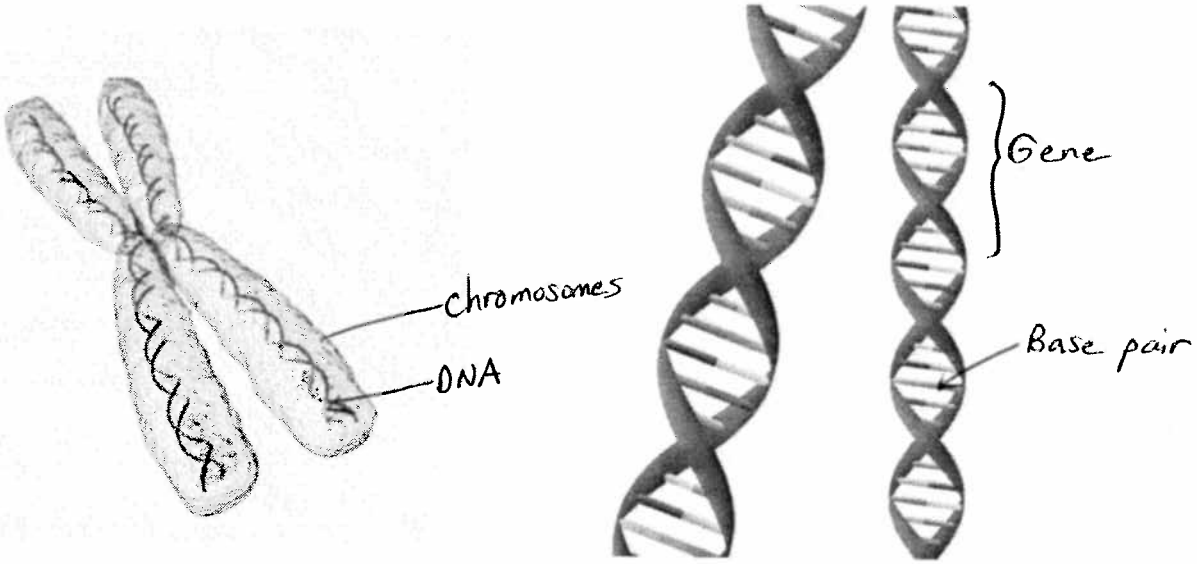
1. Animal cells and plants cells have many similarities, and some differences as well. Please list 3 key differences in their *structure* below.

3 K

Plant cells: chloroplasts
cell wall
one large vacuole (vs many smaller ones)
rectangular (vs round)

2. Using the images below, label **chromosomes**, **DNA**, **genes** and **base pairs**. Draw your arrows carefully ... if we can't tell what it's pointing to, you will not be awarded marks!

2 A



3. Of the four medical imaging technologies that we studied, which would you use in each of the following situations?

2 A

A patient has had a stroke, and her brain needs to be checked for bleeding. MRI

A pregnant woman wants to know the sex of her baby. Ultrasound

A man who fell off of a balcony needs to be checked for fractured bones. X-ray

A man is believed to have a damaged heart ... we need to see it in 3D. CAT Scan

4. Imagine that you're a molecule of water in the soil below a plant. Describe your journey from the soil to the leaves, and what could happen once you enter the leaf. Include the following terms in your story: *photosynthesis, roots, transpirational pull, xylem, phloem, leaves.*

6 C

I am a molecule of water in the soil. I get absorbed up by the root and pulled up the plant's Xylem by a combination of root pressure and transpirational pull. Eventually I arrive in the leaves where I combine with carbon dioxide to make glucose via photosynthesis. Once I turn to glucose I am pushed down the plant's phloem to be stored until I am needed for energy.

5. Describe what is a **tumour** and why may it be later diagnosed as **cancer**?

2 K

A tumour is an overgrowth of cells that have been damaged (by mutation of their DNA).

It is diagnosed as cancer if the cells spread to another part of your body.

6. Match the organelles below to their functions.

5 K

E	Nucleus	A. Storage of sugars and proteins
G	Ribosomes	B. Converts glucose into energy for the cell.
I	Endoplasmic reticulum	C. Filaments and tubules that provide a framework for the cell
D	Golgi apparatus	D. Sorts and packages proteins
H	Chloroplasts	E. Control Centre of the Cell
B	Mitochondria	F. The fluid-like matrix that holds the organelles
F	Cytoplasm	G. Creates protein
C	Cytoskeleton	H. Found only in plant cells, these are responsible for photosynthesis
A	Vacuole	I. Connected to the nucleus, responsible for shuttling nutrients in and out of the nucleus
J	Cell Wall	J. Rigid outer layer of plant cells

7. Canada currently funds certain types of stem cell research. **Explain two advantages** of using stem cells in the medical field.

Stem cells can become many other different types of cells

They can be used to help heal damaged tissue in the body

2 T

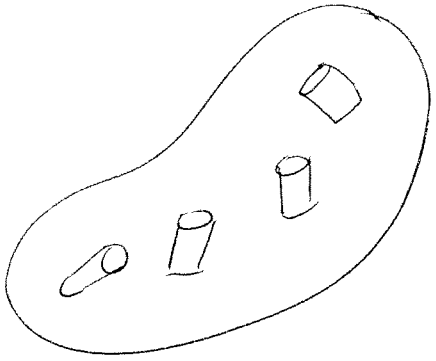
8. While president, George W. Bush prevented taxpayer money from funding embryonic stem cell research. Give **two valid arguments against** using embryos in stem cell research.

Embryos have the capacity to become humans - it could be considered "taking a life"

Embryonic cells are more prone to cancer

2 T

9. Describe the inside of a chloroplast. Use the terms *chlorophyll*, *thylakoid* and *grana*.



Thylakoids are stacked grana, which is where chlorophyll is stored. It's also where photosynthesis occurs.

3 A

10. What are the three tenets of cell theory?

- All cells come from preexisting cells
- The cell is the basic organisational unit of life
- All living things are made of one or more cells.

3 K

11. Describe *how* a tumour may form. Specifically, explain what changes inside a cell to make it different, and what causes this change to happen.

2 A

DNA gets mutated. This causes the cell to function improperly.

These mutations are caused by chemical reactions with MUTAGENS

12. Match each organ system to its function.

3 K

E	Endocrine System	A. Allows oxygen to enter our bodies
D	Integumentary System	B. Urination
B	Excretory System	C. Allows us to sense the environment around us
C	Nervous System	D. Covers the outside of our body and its organs
A	Respiratory System	E. Hormone Production
F	Circulatory System	F. Distributes oxygen throughout our bodies

13. Why does maple sap accumulate faster in the daytime than at night?

1 T

More photosynthesis!

14. What are two advantages and two disadvantages of **DNA Screening**?

2 T

Advantages	Disadvantages
-Can diagnose diseases early	-Could lead to discrimination by insurance companies, employers, etc.
-Information can help guide people's behaviour (knowledge = power)	-Costs $

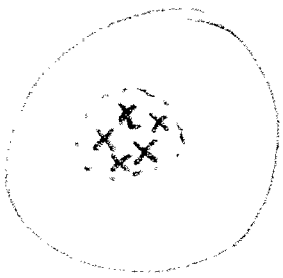
15. Explain the process of cell division. Mention each of the four stages of mitosis, and explain (or sketch) what happens in each.

2 K

4 C

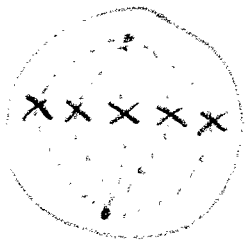
Prophase

- nuclear membrane begins to disappear
- chromosomes become visible



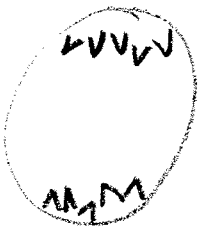
Metaphase

- chromosomes line up down centre
- centrosomes move to either side of cell



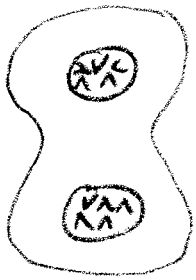
Anaphase

- Chromosomes split and get pulled to either end of the cell



Telophase

- Nuclear membranes reform
- Cell begins to pinch at centre



Note: Cell does not ACTUALLY split until AFTER mitosis (cytokinesis)

Multiple Choice – Circle the best answer for each question.

1. Which of the following is **not** one of the base pairs?

A
a) D
b) A
c) C
d) T
e) G

2. Which of the following is **not** a mutagen?

D
a) X-Rays
b) Burnt toast
c) Cigarette smoke
d) Olive Oil
e) Sunlight

6 K
3. Fat, bone and blood are examples of _____ tissue.

D
a) epithelial
b) nervous
c) muscle
d) connective

4. This type of tissue is responsible for movement in animals.

C
a) epithelial
b) nervous
c) muscle
d) connective

5. The respiratory system in humans is analogous to the _____ of plants.

E
a) Stem
b) Flower
c) Xylem
d) Phloem
e) Leaves

6. In our story, which country did **not** play a role in collecting, processing or using the heart patient's blood/stem cells?

C
a) United States
b) Dominican Republic
c) South Korea
d) Isreal